



★ VIRGINIA ★  
DEPARTMENT *of* ELECTIONS

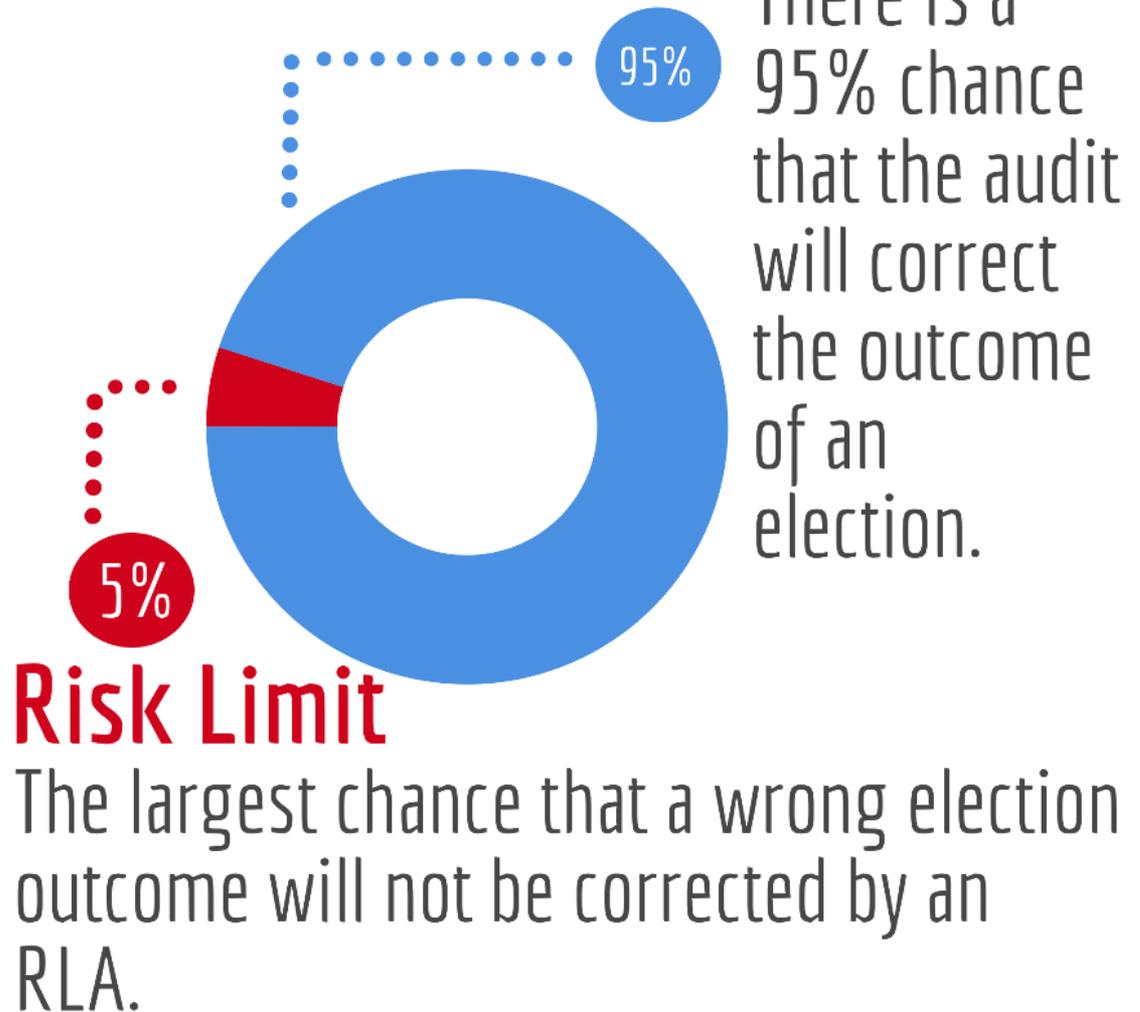
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# City of Fairfax Post-Election, Risk-Limiting Audit Pilot



## What is an RLA?

An audit that provides strong statistical evidence that the election outcome is right, and has a high probability of correcting a wrong outcome.



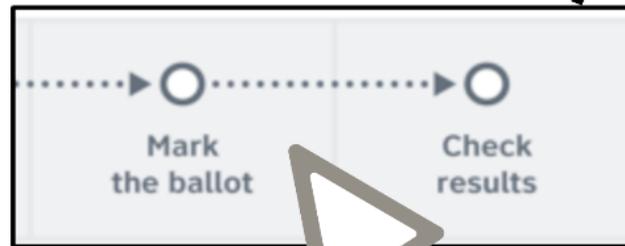
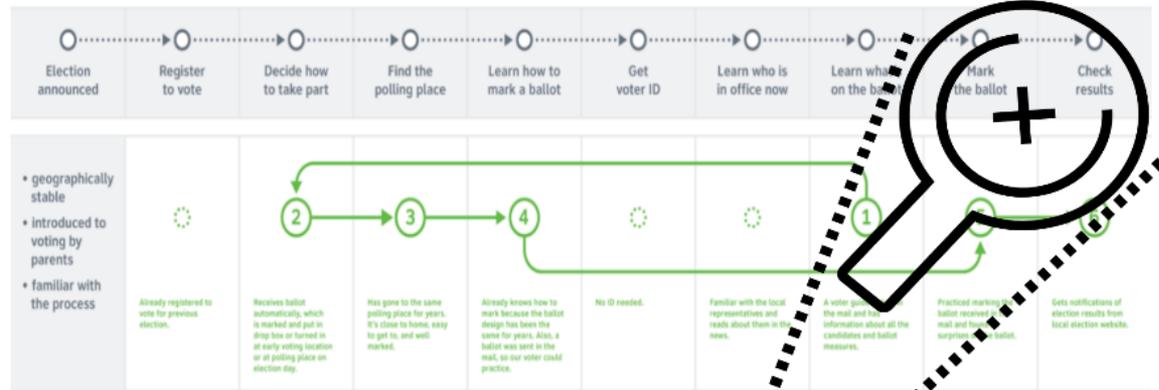


## How can RLAs help?

With voter confidence eroding, the elections community needs new tools to reassure the public that they can continue to have faith in the integrity of our elections.

RLAs are a potential tool to promote voter confidence.

## Center for Civic Design Election Pathway



?????  
**Missing Feedback Loop**



# Why are RLAs Useful?



**Measurable  
Success**



**Minimizes  
Workload**



**Transparent  
Process**



**Third Party  
Validation**



**Usable  
Data**



## Types of RLAs

Comparison



A comparison RLA is based on the blind comparison of the machine's interpretation of ballots and the manual (human) interpretation.

VS

Polling



A polling RLA is similar to an exit poll. In this case, ballots (people) are randomly selected and tabulated (polled).



# Comparison of RLA Types

## Comparison

- Requires considerably fewer ballots for the audit.
- Audit sample size is not as dependent on election margin.
- Requires less staff.
- Requires voting systems that can produce Cast Vote Records.
- Requires RLA software.
- Requires maintaining ballots in the exact order they are scanned.
- Provides tools for the auditor to correct any errors. Useful for addressing human error.

### ◀ # of Ballots ▶

### ◀ Resources ▶

### ◀ Logistics ▶

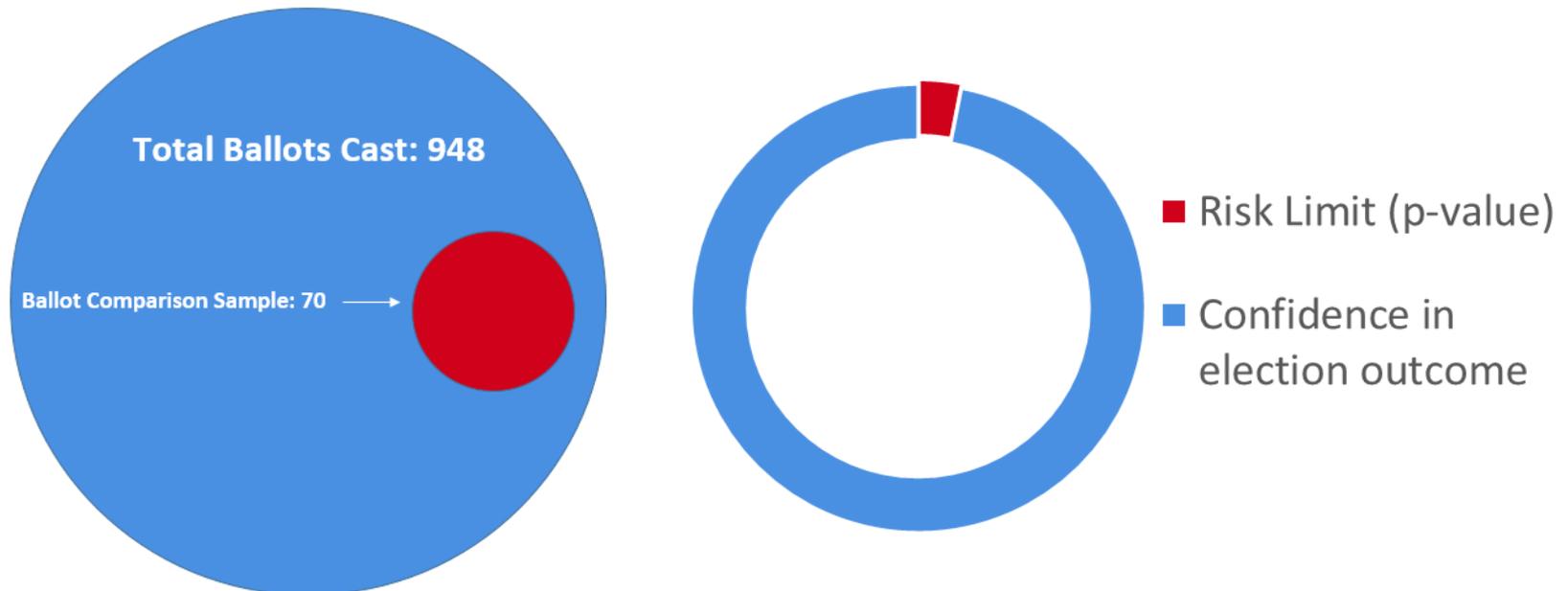
## Polling

- Requires considerably larger sample sizes.
- Sample size is heavily dependent upon the election margin.
- Minimal set-up costs.
- Requires more staffing resources.
- Requires no additional equipment or software.
- Requires more time to conduct audits due to larger sample sizes.
- Does not provide the auditor any tools to address errors.



# Ballot Comparison Audit

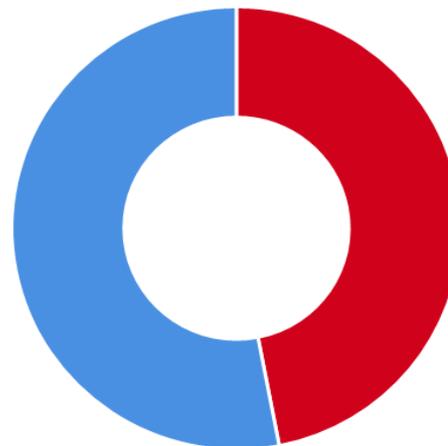
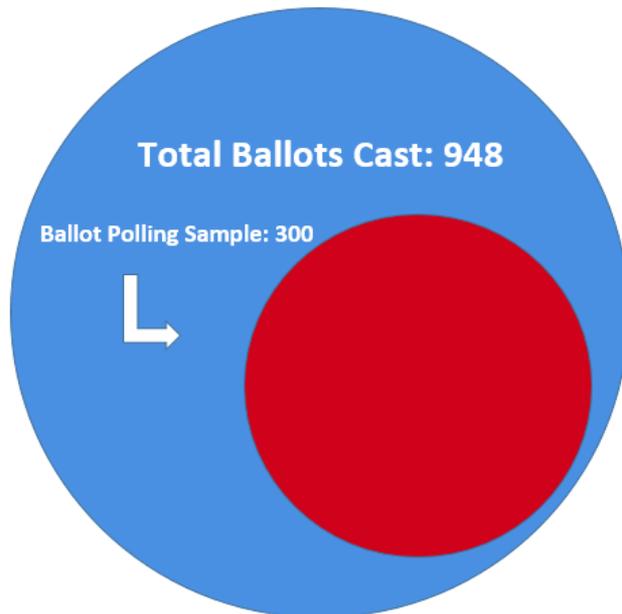
- Established risk limit: 5%
- Sample size: 70 (69 unique ballots)
- Result: p-value [risk limit] of 0.03/3.03%
  - **At least** a 96.97% chance that the audit would have identified an incorrect outcome.





# Ballot Polling Audit

- Established risk limit: 10%
- Sample size: 300 (260 unique ballots) *this number includes ballots adjudicated during the ballot comparison audit*
- Result: p-value [risk limit] of .47/47%
  - **At least** a 53% chance that the audit would have identified an incorrect outcome
    - The Risk limit was not satisfied -- in a true RLA, election officials would have selected a second round of sample ballots and completed the process again, repeating until either the risk limit was achieved or it was determined that there was a need to proceed to a full recount.



- Risk Limit (p-value)
- Confidence in election outcome



## RLA Pilot Findings

- An RLA can provide significant insight into the procedural aspects of Election Day in the polling place.
  - For example, during the audit we found an unaccounted for ballot in a precinct. The ballot was an undervote and we suspect that a voter was accidentally given two ballots that were stuck together.



# Response from the Election Community

Determining  
Voter Intent

## Cost

Procedure manuals

## Goals

## Frequency

Auditing more than one contest concurrently

Choosing an audit method    Policy mandate

Timing  
(pre or post certification?)

## Logistics

Math behind the audit

Imprinting ballots

Naming convention of precincts, batches, ballots





## What's Next?

- **September 20, 2018**
  - ELECT will provide the full report of the RLA to the State Board of Elections.



# The Way Ahead

- **Ballot Design and Scanning**
  - Post-Certification imprinting as a means to track ballots.
  - New ballot design requirements for vendors.
- **Larger Locality Testing**
  - City of Fairfax had less than 1000 ballots cast for the audited election, how can the RLA be scaled for larger localities?